

## CLAIMS

1. A system for stabilizing the temperature of a detector array comprising:  
one or more video reference pixels adapted to output a reference signal which  
is responsive to the temperature of said detector array and  
means for adjusting the temperature of said detector array based on said  
5 reference signal.

2. The invention of Claim 1 wherein said video reference pixels are constructed  
on the same substrate as said detector array.

3. The invention of Claim 1 wherein said video reference pixels are constructed  
in a manner such that they do not respond to changes in scene illumination.

4. The invention of Claim 3 wherein said video reference pixels are shielded  
from receiving scene illumination.

5. The invention of Claim 3 wherein said video reference pixels are thermally  
sunk to the substrate.

6. The invention of Claim 1 wherein said means for adjusting temperature  
includes a thermal electric cooler adapted to adjust the temperature of said detector  
array based on a current or voltage applied to the thermal electric cooler.

7. The invention of Claim 6 wherein said means for adjusting temperature  
further includes a current driver adapted to apply a current to said thermal electric  
cooler in response to a control signal.

8. The invention of Claim 7 wherein said means for adjusting temperature

further includes a processor running a control algorithm which outputs a control signal to said current driver in response to said reference signal.

9. The invention of Claim 8 wherein said means for adjusting temperature further includes an analog to digital converter which digitizes the output of said reference pixels for input to said processor.

10. The invention of Claim 8 wherein said algorithm calculates the amount of current which should be sent to the thermal electric cooler in order to maintain the detector array at a desired temperature.

11. The invention of Claim 8 wherein said control algorithm compares the reference signal to a predetermined set-point and generates a control signal based on said comparison.

12. The invention of Claim 8 wherein said algorithm includes multiple types of controllers.

13. The invention of Claim 12 wherein said algorithm further includes a selector that chooses which controller to use based on said reference signal and how close it is to a predetermined set-point.

14. The invention of Claim 1 wherein said reference signal is multiplexed with signals from the detector array.

15. A system for stabilizing the temperature of a detector array comprising:  
one or more video reference pixels adapted to output a reference signal that is responsive to the temperature of said detector array;

analog to digital converter that digitizes the output of said reference pixels;

5 a processor running a control algorithm which outputs a control signal in

response to said digitized reference signal;  
a thermal electric cooler adapted to adjust the temperature of said detector array based on a current or voltage applied to the thermal electric cooler; and  
a current driver adapted to apply a current to said thermal electric cooler in  
10 response to said control signal.

16. The invention of Claim 15 wherein said video reference pixels are constructed from the same substrate as said detector array.

17. The invention of Claim 15 wherein said video reference pixels are constructed in a manner such that they do not respond to changes in scene illumination.

18. The invention of Claim 17 wherein said video reference pixels are shielded from receiving scene illumination.

19. The invention of Claim 17 wherein said video reference pixels are thermally sunk to the substrate.

20. The invention of Claim 15 wherein said control algorithm calculates the amount of current which should be sent to the thermal electric cooler in order to maintain the detector array at a desired temperature.

21. The invention of Claim 15 wherein said control algorithm compares the reference signal to a predetermined set-point and generates a control signal based on said comparison.

22. The invention of Claim 15 wherein said algorithm includes multiple types of controllers.

23. The invention of Claim 22 wherein said algorithm further includes a selector

that chooses which controller to use based on said reference signal and how close it is to a predetermined set-point.

24. The invention of Claim 15 wherein said reference signal is multiplexed with signals from the detector array.

25. A method for stabilizing the temperature of a detector array including the steps of:

obtaining a reference signal indicative of the temperature of said detector array using one or more video reference pixels;

5        calculating the amount of current which should be sent to a thermal electric cooler in order to maintain the detector array at a desired temperature based on said reference signal; and

      sending the calculated amount of current to a thermal electric cooler adapted to adjust the temperature of said detector array.